

REMARKS

Claims 1-42 were pending. Claims 34-43 were withdrawn from consideration in the Office Action mailed February 13, 1998 (the "Office Action"), as being drawn to unelected species. As this Amendment A demonstrates the allowability of generic Claims 1-4 and 14-19, Applicants respectfully assert entitlement to consideration of claims 34-42, as amendment herein, and to new Claims 43 and 44 for which Claims 1-4 and 14-19 are also generic. Claims 1-42 have been amended. Claims 43 and 44 have been added. Claims 1-44 are now pending.

On March 11, 1998, Applicants submitted a Request For Response Period To Be Reset in accordance with MPEP 710.06. True copies of the originally submitted Request and the acknowledgment postcard are attached hereto. Applicants respectfully submit that, in accordance with the requirement for response periods as set forth in MPEP 710.06, no extension fees should be charged for filing this Amendment A in response to the Office Action mailed on February 13, 1998.

Rejection under 35 U.S.C. § 112 ¶ 2

On pages 2 and 3 of the Office Action, Claims 1-42 were rejected under 35 U.S.C. § 112 ¶ 2. These claims have been amended to more particularly point out and distinctly claim that which the Applicants regard as their invention and to overcome or avoid the foregoing rejection.

Rejection under 35 U.S.C. § 102(b) and § 103(a)

Claims 1-32 were rejected in the Office Action variously under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent 62-48028 (Japan '028) or under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent 62-48028 Doan et al.

in view of Japanese Patent 63-300526 (Japan '526). Applicants respectfully traverse the rejections and request consideration of the following.

As an aid to communicating Applicants' comments, translations of each of Japan '028 and Japan '526 are included with this Amendment A.

Both the claimed invention and Japan '028 implant ions of a material into a layer of the material. The claimed invention implants ions directly into an exposed surface of the layer of the first type of material. Japan '028, however, does not implant ions directly into an exposed surface of the layer of the first type of material.

Japan '028 differs from Applicants' invention in that the ions must first be passed through a layer of silicon dioxide that is 500 Å thick before the ions are implanted into an underlying layer of silicon. The layer of silicon is not exposed during implantation. Japan '028 teaches that a 500 Å layer of silicon dioxide is necessary to prevent contamination.

The presence of the 500 Å thick layer of silicon dioxide during implantation of the underlying and unexposed silicon layer presents a variety of difficulties and obstacles that are overcoming by the claimed invention. Implanting a 500 Å thick layer of silicon dioxide requires elaborate and high powered implantation equipment. The layer of silicon dioxide makes the implantation process more difficult to control because the ions are scattered as they bombard the layer of silicon dioxide. The scattering of the ions result in an implanted region in the silicon layer that is larger and exhibits more lateral straggle in the resultant implanted profile than if the layer of silicon dioxide were not present.

The presence of the 500 Å thick layer of silicon dioxide in Japan '028 slows down the subsequent oxidation process, which in turn permits a greater degree of undesirable lateral straggle in the resultant oxidized region. This straggle works against Applicants' design to reduce bird's beak structures in field oxide regions and the problems accompanying bird's beak structures.

By Applicant's teaching of implanting directly into an exposed surface of the layer which is desired to be implanted, the implantation process requires less energy and is more controlled in that there is a reduction of ion scattering as compared to Japan '028. The direct implantation into an exposed surface of layer of crystalline material allows for a greater amount of transformation of crystalline material into an amorphous form. The amorphous form more readily oxidizes than does a crystalline form, thus affording an easier and faster subsequent oxidation of the amorphous material created in the direct implantation.

In Figure 1(b) of each of Japan '028 and Japan '526, it is taught to implant ions through an oxide layer and into an unexposed and underlying layer. Moreover, none of the references of record, either alone or in combination, teach the recitations of Claims 1-44.

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance of claims 1-44 at an early date is solicited. In the event that the Examiner finds any remaining impediment to a prompt allowance of this application which could be clarified by a telephonic interview, the Examiner is respectfully requested to initiate

the same with the undersigned attorney.

Dated this on the 19 day of June, 1998.

Respectfully submitted,



Bradley K. DeSandro
Attorney for Applicant
Registration No. 34,521

WORKMAN, NYDEGGER & SEELEY
1000 Eagle Gate Tower
60 East South Temple
Salt Lake City, Utah 84111
Telephone: (801) 533-9800
Facsimile: (801) 328-1707

Transmitted: Amendment Transmittal Letter

Amendment A

Check No. 103623 in the amount of \$44.00 for extra claims fee

English translation of Japan 63-300526 and Japan 62-48028

Request For Response Period To Be Reset submitted on 3/11/98 and
an acknowledgment postcard for the Request For Response Period To

Be Reset

Postcard

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